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the object of the questions is to inquire whether the instructor is likely to help students more if he carries on research than if he does not, and my reply is in the affirmative, with the qualification that this is not based on definite knowledge and that much depends on conditions. There is probably a high correlation between ability to carry on research and ability to teach, and the productive scholar or scientific man is more likely to have a beneficial influence on the student than a professor who does nothing but teach and attend athletic events.

15. The stimulating effect of research is doubtless to a large extent due to professional recognition, and in return professional recognition stimulates research. The university should consequently promote the means of publication by professors and instructors, pay their expenses to attend scientific meetings, invite scholars and scientific men from other institutions to lecture and give courses, arrange for the exchange of instructors and the like.

16. It is more desirable for instructors in the department of education to study methods of instruction than for instructors in other departments to do so.

17. The more advanced a student is, the more desirable is it that his instructors should be engaged in research work. This would also be desirable even in elementary schools, but it is not at present feasible to obtain teachers competent to do research work or to pay them. Perhaps if salaries were more adequate all the way from the elementary school to the university, it might be possible to obtain men competent to do research work, to the great benefit of the students and of the world.

18. Under existing conditions the college or university which fails to provide for research work by its instructors is likely to have mediocre teaching. The better men tend to go to institutions where they will be encouraged to do research work and those who stay are apt to adopt the attitude of the schoolmaster rather than that of the professor. The university or college which does not regard the advancement of knowledge and public

service as part of its functions has small claim to public support or private gifts, and is likely to deteriorate in all directions.

19. The amount of productive scholarship and research work conducted in America has increased many fold since the introduction of graduate work in the universities in the seventies, and at present three fourths of our productive scientific men are supported by our universities and colleges. The majority of our leading scientific men are connected with a few universities doing graduate work.

20. It is obvious that if the instructor devotes all his time to teaching, he can not do research work. The science in which America was most productive, prior to the introduction of the modern university, was astronomy, in which subject a large amount of undergraduate teaching was not required. Those men doing the most valuable work do not devote the larger part of their time to undergraduate or class teaching. A professor can teach by example as well as by lecturing.

21. I doubt whether most administrative work by instructors has a stimulating and broadening effect on their teaching. One of the chief dangers to the American university is that honor, influence and salary are given to administrative officers instead of to the productive scholars and men of science who are the university.

J. MCKEEN CATTELL

#### SECTION OF ZOOLOGY OF THE AMERICAN ASSOCIATION

SECTION F—Zoology—of the American Association for the Advancement of Science will hold its annual meeting at Philadelphia, December 29, 30 and 31, in conjunction with the American Society of Zoologists and the American Society of Naturalists. All sessions will be held in the lecture room of the zoological department of the University of Pennsylvania. A joint symposium has been arranged for the afternoon of Thursday, December 31, with the following program:

E. G. Conklin—The cultural value of zoology.

C. B. Davenport—The value of scientific genealogy.

G. H. Parker—The coming problems of eugenics.  
Stuart Paton—Modern aspects of the study of the mind.

H. F. Osborn—The museum in the public service.

The address of Dr. Mayer, the retiring Vice-president of Section F, will be given at the close of the Naturalists' banquet, Thursday evening, December 31. Dr. Mayer will speak with lantern illustrations upon the work of the Tortugas Laboratory.

As under the rules of the American Association the officers of national societies take charge of the program of joint meetings, the program of the Philadelphia meeting will be in the hands of the officers of the American Society of Zoologists. All titles and abstracts of papers therefore should be sent to Professor Caswell Graves, Johns Hopkins University, before the first of December. But members of Section F, American Association for the Advancement of Science, who are not members of the American Society of Zoologists, may send them to H. V. Neal, Tufts College, Mass.

#### SCIENTIFIC NOTES AND NEWS

THE National Academy of Sciences will hold its autumn meeting at the University of Chicago on December 7, 8 and 9.

THE Association of German Scientific Men and Physicians will hold no meeting this year.

THE past and present members of the scientific staff of the Rockefeller Institute for Medical Research gave a dinner at Delmonico's to Dr. Simon Flexner on October 16, in celebration of the tenth anniversary of the opening of the laboratories of the institute under his direction. The members of the board of scientific directors and of the board of trustees were present but the dinner was not public. Dr. S. J. Meltzer presided; a short address, engrossed on parchment and signed by the members of the staff, was read and presented to Dr. Flexner. The following spoke: Dr. W. H. Welch, Mr. F. T. Gates, Mr. John D. Rockefeller, Jr., Dr. Peyton Rous, Dr. Hideyo Noguchi, Dr. F. R. Fraser, Dr. Jacques Loeb, Dr. Rufus Cole and Dr. Flexner.

THE *Observatory* states that among the visitors to the Royal Observatory, Greenwich, during September, were Professor and Mrs. W. W. Campbell, Professor H. D. Curtis and party of the Lick Observatory, and Professor C. D. Perrine and Mr. Mulvey, of the Cordoba Observatory. Both parties were returning from eclipse expeditions in Russia, neither of which, unfortunately, met with success, owing to cloudy skies. The Lick Observatory party was stationed near Kiev, practically on the central line, while the Cordoba observers were near Theodosia with Professor and Mrs. Newall.

DR. ALBRECHT PENCK, professor of geography at Berlin, and Dr. Otto Maas, professor of zoology at Munich, who attended as guests the meeting of the British Association for the Advancement of Science in Australia, are, according to a press despatch, detained in England. Dr. Otto Lutz, professor of biology in the Instituto Nacional de Panama, the author of an article in the last number of *SCIENCE*, is held there as a prisoner of war.

LEAVE of absence has been granted by the trustees of Princeton University to Professor Pierre Boutroux, of the department of mathematics, who is in the French service, and to Professor Joseph H. W. Wedderburn, of the same department, who has returned to England to enlist in the British army.

DR. ROBERT W. GEDDES, professor of anatomy in McGill University, has been called by the British war office to take command in one of the home regiments. Dr. Geddes was a reservist of the British army, having served with distinction in the South African War. He became professor of anatomy in McGill in 1912.

THE New York Section of the American Chemical Society has appointed a committee to examine into the feasibility of expanding the manufacture of chemicals and dyestuffs in the United States. This committee is composed of H. A. Metz, I. F. Stone, J. B. F. Herreshoff, David Jayne, J. M. Matthews, Allen Rogers and B. C. Hesse, chairman.